



University of Bahrain

CIT -- UOB

TEST 2 (14 Dec 2014) ITCE 363: Electronics 2

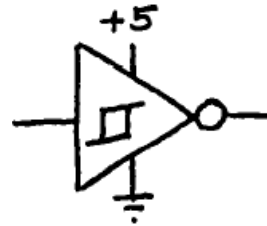
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Q1. [50 marks]

- a) Using the integrated Schmitt trigger *inverter* below (a CMOS logic gate with fixed hysteresis), and a resistor and capacitor, design a 1 MHz square-wave oscillator. Assume that the inverter, which is powered from +5V, has thresholds at 1.4V and 3.6V (that is, it has hysteresis of 2.2V, centered on 2.5V). *Hint* : the threshold voltages have been chosen not to give you a hard time, but to make your arithmetic *easy*!

- b) **Plot the transfer characteristics of the gate**

- c) **Plot the i/p and o/p waveforms of the oscillator**



Q2. [50 marks]

Draw clearly a Colpitts oscillator circuit and derive its frequency of oscillation and condition for oscillation equations.